



Technical Assistance Services for Communities

West Lake Landfill Superfund Site Fact Sheet #6 – October 2014

Air Monitoring at West Lake Landfill

Introduction

This fact sheet summarizes air monitoring activities at the West Lake Landfill. Air monitoring is taking place on site and off site, and is being conducted before and during the installation of the isolation barrier.

On-site Air Monitoring

The site's potentially responsible parties (PRPs) are planning to conduct on-site air monitoring at 13 locations. The June 2014 Work Plan for Removal Action Preconstruction Work describes this work. Air monitoring will begin before isolation barrier construction begins, and the system will continue to operate during construction. After installation of the barrier, the system will collect additional data before any other remedial actions take place for areas of West Lake Landfill with radiologically impacted material (also referred to as operable unit 1, or OU-1).

Air monitoring activities will include sampling for airborne radioactive particulates, radon gas and volatile organic compounds (VOCs), and will measure gamma radiation at each sampling location. Sampling will be performed continuously at the perimeter of OU-1 and at multiple on-site locations. Proposed sampling locations are shown in Figure 1. Table 1 describes what will be measured, the frequency of the measurements and the type of sampling devices used.



Figure 1: Proposed on-site air monitoring locations

The information is provided by the Technical Assistance Services for Communities (TASC) program. The fact sheet's contents do not necessarily reflect the opinions or position of the U.S. Environmental Protection Agency (EPA).

Table 1: On-site Air Monitoring Details

Parameter Measured	Sampling Mode and Collection Frequency	Sampling Device
<i>Proposed sampling at all locations</i>		
Total alpha and beta activity (and total particulate mass at locations A05, A07, A08, A10 and A11)	Continuous / every 28 days	Metered air pump with dual-chamber sampler for particulate fiber filter at A01, A05, A07, A08 and A11; metered air pump with filter to collect particulates at remaining eight locations
Radon-222 and radon daughters	Continuous / quarterly	Alpha track etch detector for radon gas
Gamma radiation levels	Continuous / quarterly	Radiation dosimeter (TLD)
<i>Proposed additional sampling at A01, A05, A07, A08 and A11</i>		
VOCs	Continuous / every 28 days	Radiello RAD130 Canister
<i>Meteorological monitoring station (on top of the landfill office building, 13570 St. Charles Rock Road)</i>		
Wind speed and direction	Continuous	High-resolution wind sensor
Notes: Adapted from Table 4-1 of Appendix B of the Work Plan for Removal Action Preconstruction Work, Engineering Management Support, Inc. May 16, 2014, revised June 20, 2014.		

Table 2 shows numerical air monitoring limits for radionuclides that emit alpha and beta particles. The total alpha and beta activity measurements in Table 1 will be compared to the gross alpha and beta investigative levels shown in Table 2. Samples with analytical results exceeding the gross alpha or gross beta investigative level for the indicated area of activity will be analyzed to identify and quantify the radioisotopes in the sampled material. The investigative levels are set lower than the maximum allowable concentrations in air. This allows a safety margin while additional evaluations of the radioisotopes are completed, if needed.

Table 2: Numerical Air Monitoring Limits for Alpha and Beta Emitters

Area of Activity	Maximum Allowable Time-weighted Air Concentration (μCi/mL)	Gross Alpha Investigative Levels		Gross Beta Investigative Levels	
		μCi/mL	dpm/m ³	μCi/mL	dpm/m ³
Inside work area	7.7 x 10 ⁻¹² ^a	1.62E-12 ^b	3.6 ^b	3.15E-13 ^c	0.7 ^c
Work area boundary	3.5 x 10 ⁻¹⁴ ^d	2.93E-14 ^e	0.065 ^e	5.86E-15 ^f	0.013 ^f
Fence line/perimeter	7.0 x 10 ⁻¹⁵ ^g	5.86E-15 ^h	0.013 ^h	1.35E-15 ⁱ	0.003 ⁱ
Notes: μCi/mL = microcuries per milliliter of air. dpm/m ³ = decays per minute per cubic meter of air. ^a Calculated from 10 CFR part 20, Appendix B, Table 1 Derived Air Concentrations (DACs), and the expected mixture of isotopes (Auxier, 2014). ^b Airborne activity of alpha emitters in the mixture that are present at 25 percent of the DAC. ^c Airborne activity of beta emitters in the mixture that are present at 25 percent of the DAC. ^d Calculated from 10 CFR part 20, Appendix B, Table 2 Effluent Concentrations (Air) and expected mixture of isotopes. ^e Airborne activity of alpha emitters in the mixture that are present at the effluent limit of 50 millirem/year (mrem/y), assuming 8,760 hours of discharge a year. ^f Airborne activity of beta emitters in the mixture that are present at the effluent limit of 50 mrem/y, assuming 8,760 hours of discharge a year. ^g Calculated using 20 percent of the 10 CFR part 20, Appendix B, Table 2 Effluent Concentrations (Air) and expected mixture of isotopes. ^h Airborne activity of alpha emitters in the mixture that are present at the National Emission Standards for Hazardous Air Pollutants (NESHAPS) limit of 10 mrem/y, assuming 8,760 hours of discharge a year. ⁱ Airborne activity of beta emitters in the mixture that are present at the NESHAPS limit of 10 mrem/y, assuming 8,760 hours of discharge a year.					

If the analytical results for radon gas indicate levels greater than 4 pCi/L, radon-220 detectors will be added to all monitoring stations. VOC results from ambient upwind and downwind monitoring stations will be compared against applicable criteria and/or risk-based screening levels for specific VOCs.

Off-site Air Monitoring

EPA is conducting two phases of air monitoring at five off-site locations (see Figure 2). The locations are:

1. Robertson Fire Protection District Station 2
2. Pattonville Fire Protection District Headquarters
3. Pattonville Fire Department Station 2
4. Spanish Village Park
5. St. Charles Fire Department Station 2

Initial baseline monitoring started in June 2014. This monitoring is described in the May 2014 Quality Assurance Project Plan for Baseline Off-Site Air Monitoring.



Figure 2: Off-site air monitoring locations

Table 3 shows what will be measured at each off-site sampling station, the frequency of sampling and sample collection, and the type of sampling devices used during initial sampling. The second phase of air monitoring will begin before construction of the isolation barrier begins.

Table 3: Off-site Sampling Details

Parameter Measured	Sampling Mode and Collection Frequency	Sampling Device
Gamma activity	Continuously / remotely transmitted	Saphymo GammaTRACER and RAE Systems AreaRAE
Gamma activity	Continuously / every 30 days	Termoluminescence dosimeters (TLDs)
Alpha-, beta- and gamma-emitting radionuclides	Continuously / every 7 days	Airborne particulates collected on borosilicate glass fiber filter media using high-volume air samplers
Radon	Continuously / every 7 days	Electret ion chamber radon detectors (E-PERM®) equipped with a high-volume chamber (“H-chamber”) short-term (“ST”) electrets
VOCs	24 hour sample /once per week	Summa canister to collect sample for laboratory analysis by EPA Method T0-15
Carbon monoxide (CO), hydrogen sulfide (H ₂ S), sulfur dioxide (SO ₂) and VOCs	Continuously / remotely transmitted	RAE Systems equipped with CO, H ₂ S, SO ₂ and photo-ionization (for VOC detection)
Particulate matter less than 2.5 micrometers in diameter	Continuously / remotely transmitted	DataRAM air particulate monitor